

TOSHIBA PHOTOCOUPLER PHOTO RELAY

TLP598G

TELECOMMUNICATION

DATA ACQUISITION

MEASUREMENT INSTRUMENTATION

The TOSHIBA TLP598G consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOS FET in a six lead plastic DIP package (DIP6).

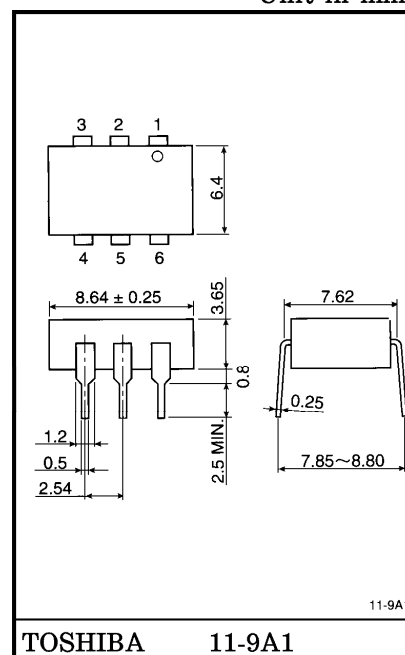
The TLP598G is a bi-directional switch which can replace mechanical relays in many applications.

- Peak Off-State Voltage : 400 V (MIN.)
- On-State Current : 150 mA (MAX.) (A Connection)
- On-State Resistance : 12 Ω (MAX.) (A Connection)
- Isolation Voltage : 2500 Vrms (MIN.) (A Connection)
- UL Recognized : UL1577, File No. E67349
- Trigger LED Current ($T_a = 25^\circ\text{C}$)

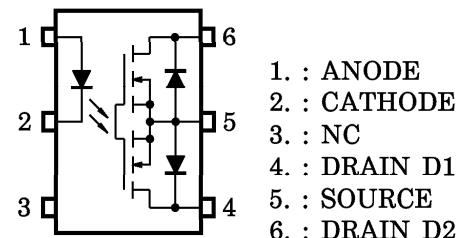
CLASSIFICATION (Note 1)	Trigger LED Current (mA)		MARKING OF CLASSIFICATION
	@I _{ON} = 150 mA		
	Min.	Max.	
(IFT2)	—	2	T2
Standard	—	5	T2, blank

(Note 1) : Application type name for certification test,
please use standard product type name, i.e.
TLP598G (IFT2) : TLP598G

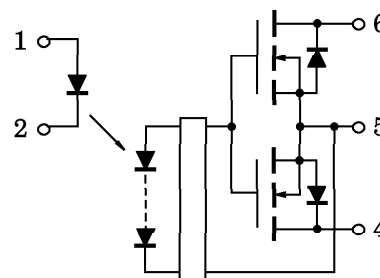
Unit in mm



PIN CONFIGURATION (TOP VIEW)



SCHEMATIC



980910EBC2

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- Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.
- The products described in this document are subject to the foreign exchange and foreign trade laws.
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MAXIMUM RATINGS (Ta = 25°C)

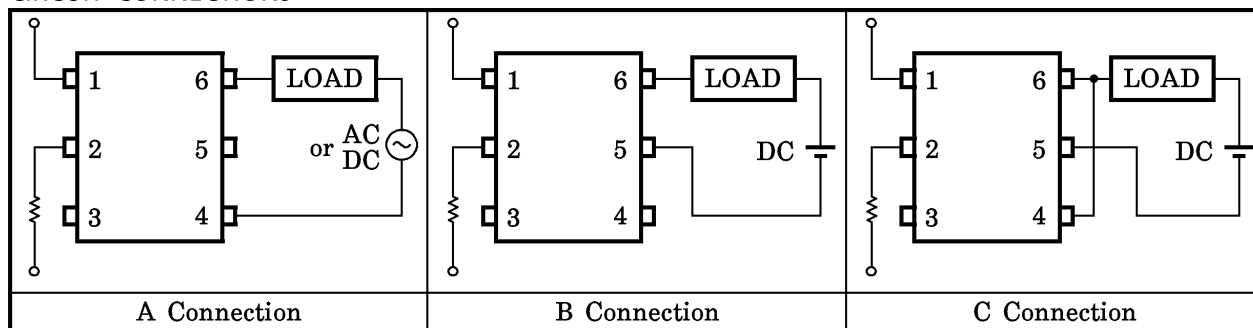
CHARACTERISTIC			SYMBOL	RATING	UNIT
LED	Forward Current		I _F	30	mA
	Forward Current Derating (Ta ≧ 25℃)		ΔI _F / °C	−0.3	mA / °C
	Peak Forward Current (100 μs pulse, 100 pps)		I _{FP}	1	A
	Reverse Voltage		V _R	5	V
	Junction Temperature		T _j	125	°C
DETECTOR	Off-State Output Terminal Voltage		V _{OFF}	400	V
	On-State RMS Current	A Connection	I _{ON}	150	mA
		B Connection		200	
		C Connection		300	
	On-State Current Derating (Ta ≧ 25℃)	A Connection	ΔI _{ON} / °C	−1.5	mA / °C
		B Connection		−2.0	
		C Connection		−3.0	
	Junction temperature		T _j	125	°C
Storage Temperature Range		T _{stg}	−55~125	°C	
Operating Temperature Range		T _{opr}	−40~85	°C	
Lead Soldering Temperature (10 s)		T _{sol}	260	°C	
Isolation Voltage (AC, 1 min., R.H. ≦ 60%) (Note 2)		BV _S	2500	V _{rms}	

(Note 2) : Device considered a two-terminal device : Pins 1, 2 and 3 shorted together, and pins 4, 5 and 6 shorted together.

RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V _{DD}	—	—	320	V
Forward Current	I _F	10	15	20	mA
On-State Current	I _{ON}	—	—	150	mA
Operating Temperature	T _{opr}	−20	—	80	°C

CIRCUIT CONNECTIONS



INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	V_F	$I_F = 10 \text{ mA}$	1.2	1.4	1.7	V
	Reverse Current	I_R	$V_R = 3 \text{ V}$	—	—	10	μA
	Capacitance	C_T	$V = 0, f = 1 \text{ MHz}$	—	30	—	pF
DETECTOR	Off-State Current	I_{OFF}	$V_{OFF} = 400 \text{ V}$	—	—	1	μA
	Capacitance	C_{OFF}	$V = 0, f = 1 \text{ MHz}$	—	—	—	pF

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current		I_{FT}	$I_{ON} = 150 \text{ mA}$	—	1	5	mA
On-State Resistance	A Connection	R_{ON}	$I_{ON} = 150 \text{ mA}, I_F = 10 \text{ mA}$	—	8	12	Ω
	B Connection		$I_{ON} = 200 \text{ mA}, I_F = 10 \text{ mA}$	—	4	6	
	C Connection		$I_{ON} = 300 \text{ mA}, I_F = 10 \text{ mA}$	—	2	3	

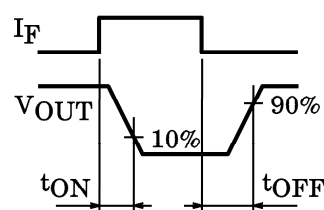
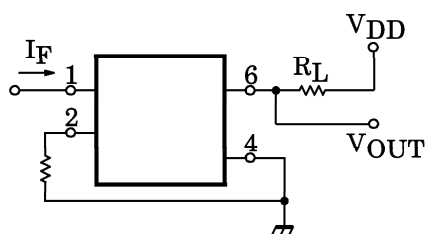
ISOLATION CHARACTERISTICS (Ta = 25°C)

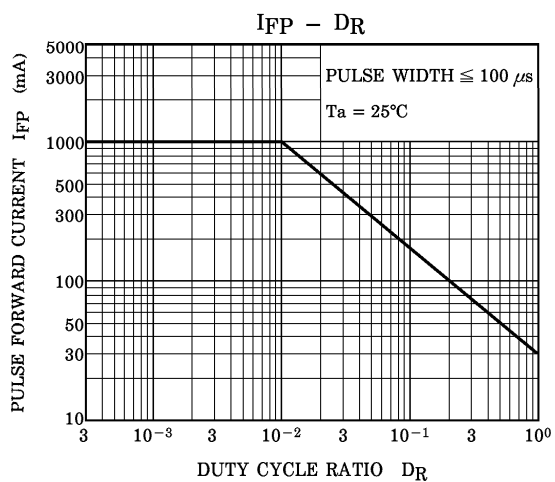
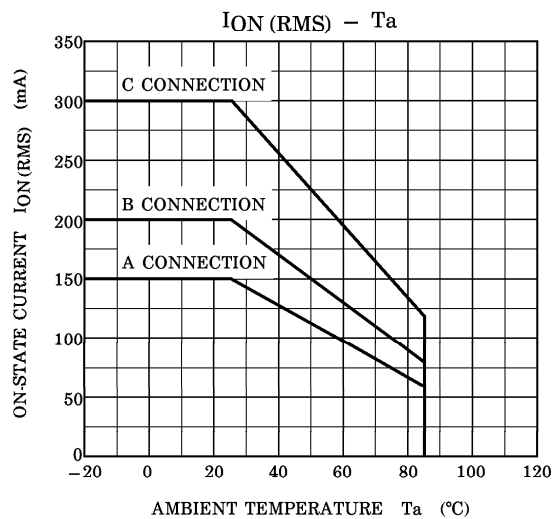
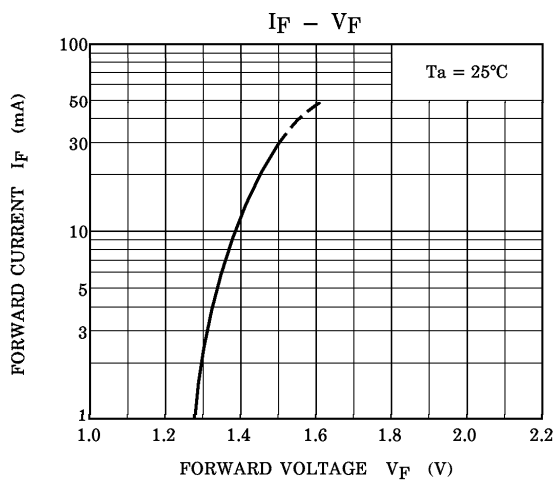
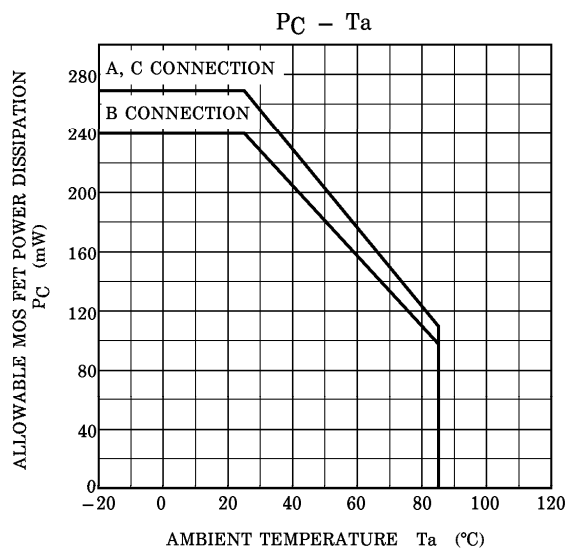
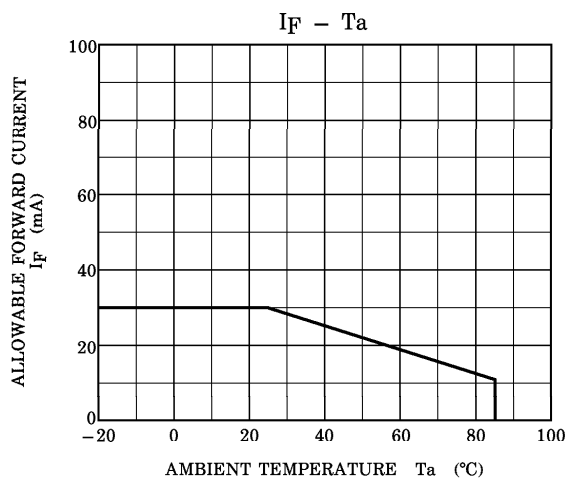
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	C_S	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation Resistance	R_S	$V_S = 500 \text{ V}, R.H. \leq 60\%$	5×10^{10}	10^{14}	—	Ω
Isolation Voltage	BV_S	AC, 1 minute	2500	—	—	Vrms
		AC, 1 second (in Oil)	—	5000	—	
		DC, 1 minute (in Oil)	—	5000	—	VDC

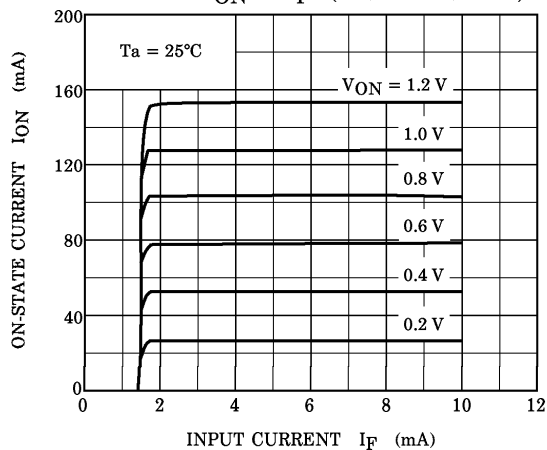
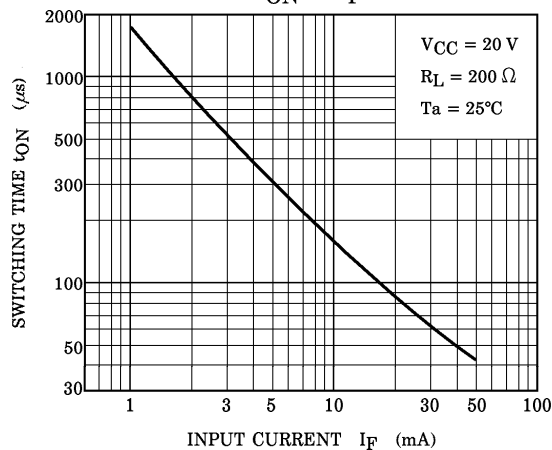
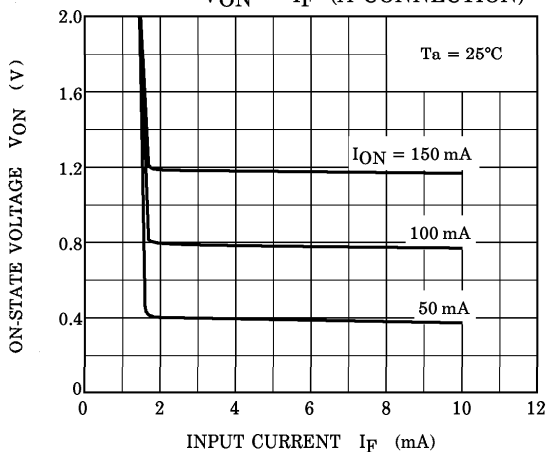
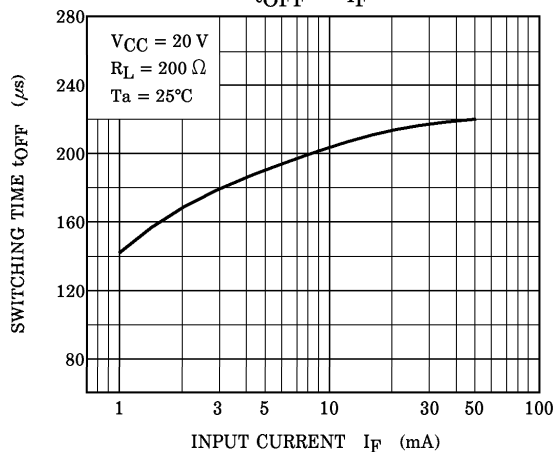
SWITCHING CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Turn-on Time	t_{ON}	$V_{DD} = 20 \text{ V}, R_L = 200 \Omega$	—	0.3	1.0	ms
Turn-off Time	t_{OFF}	$I_F = 10 \text{ mA}$ (Note 3)	—	0.2	1.0	

(Note 3) : SWITCHING TIME TEST CIRCUIT





$I_{ON} - I_F$ (A CONNECTION) $t_{ON} - I_F$  $V_{ON} - I_F$ (A CONNECTION) $t_{OFF} - I_F$  $I_{ON} - V_{ON}$ (A CONNECTION)